What Is Claimed Is:

1. A composition comprising a first oligomer and a second oligomer, wherein:

at least a portion of said first oligomer is capable of hybridizing with at least a portion of said second oligomer,

at least a portion of said first oligomer is complementary to and capable of hybridizing to a selected target nucleic acid, and

at least one of said first or said second oligomer includes at least one A and G modified binding base.

2. The composition of claim 1 wherein said first and said second oligomers are a complementary pair of siRNA oligomers.

3. The composition of claim 1 wherein said first and said second oligomers are an antisense/sense pair of oligomers.

4. The composition of claim 1 wherein each of said first and second oligomers has 12 to 50 nucleotides.

5. The composition of claim 1 wherein each of said first and second oligomers has 15 to 30 nucleotides.

6. The composition of claim 1 wherein each of said first and second oligomers has 21 to 24 nucleotides.

7. The composition of claim 1 wherein said first oligomer is an antisense oligomer.

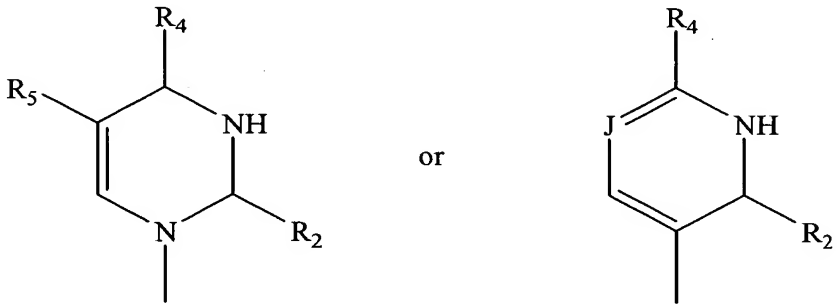
8. The composition of claim 7 wherein said second oligomer is a sense oligomer.

9. The composition of claim 7 wherein said second oligomer has a plurality of ribose nucleotide units.

10. The composition of claim 1 wherein said first oligomer includes said nucleotide having an A and G modified binding base.

11. The composition of claim 1 wherein said A and G modified binding base is a boronated A and G modified binding base having a boron-containing substituent selected from the group consisting of $-BH_2CN$, $-BH_3$, and $-BH_2COOR$, wherein R is C1 to C18 alkyl.

12. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of one of the following structures:



wherein:

J is N or CH;

R_5 is H or CH_3;

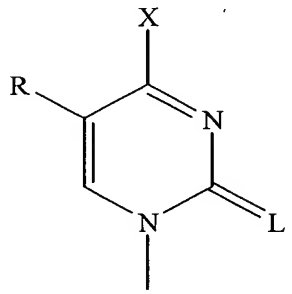
one of R_2 and R_4 is =O, =NH, or $=NH_2^+$ or the tautomeric form -OH, $-NH_2$, $-NH_3^+$; and the other of R_2 and R_4 is Q, $=C(R_A)$-Q, $C(R_A)(R_B)$-$C(R_C)(R_D)$-Q, $C(R_A)=C(R_C)$-Q or C≡C-Q;

R_A, R_B, R_C and R_D, independently, are H, SH, OH, NH_2, or C_1 -$C_{20\ alkyl}$, or one of $(R_A)(R_B)$ or $(R_C)(R_D)$ is =O;

Q is halogen, hydrogen, C_1-C_{20} alkyl, C_1-C_{20} alkylamine, C_1-C_{20} alkyl-N-phthalimide, C_1-C_{20} alkylimidazole, C_1-C_{20} alkylbis-imidazole, imidazole, bis-imidazole, amine, N-phthalimide, C_2-C_{20} alkenyl, C_2-C_{20} alkynyl, hydroxyl, thiol, keto, carboxyl, nitrate, nitro, nitroso, nitrile, trifluoromethyl, trifluoromethoxy, O-alkyl, S-alkyl, NH-alkyl, N-dialkyl, O-aralkyl, S-aralkyl, NH-aralkyl, azido, hydrazino, hydroxylamino, isocyanato, sulfoxide, sulfone, sulfide, disulfide, or silyl; and

when R_2 is =O, R_4 is other than hydroxyl or amine.

13. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



wherein

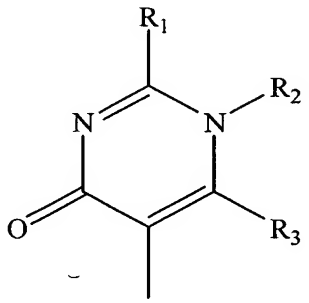
X is hydroxyl or amino;

R is halo or C_1-C_6 alkyl or substituted C_1-C_6 alkyl wherein said substitution is halo, amino, hydroxyl, thiol, ether or thioether;

L is oxygen or sulfur; and

when X is hydroxyl and L is oxygen, R is other than C_1 alkyl.

14. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of the following structure:

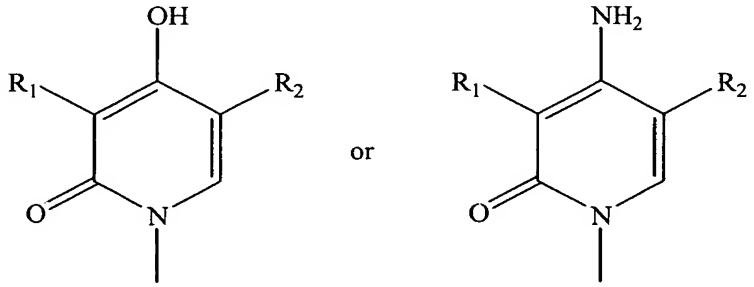


wherein

R_1, R_2, and R_3 can be same or different and are hydrogen, halogen, hydroxy, thio or substituted thio, amino or substituted amino, carboxy, lower alkyl, lower alkenyl, lower alkinyl, aryl, lower alkyloxy, aryloxy, aralkyl, aralkyloxy or a reporter group.

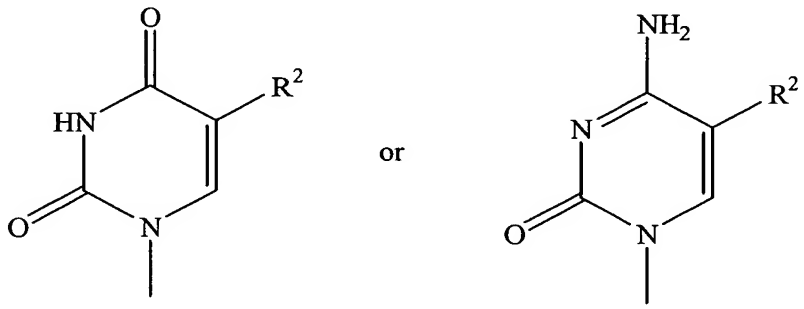
15. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base selected from the group consisting of 2-fluoropyridine-3-yl, pyridin-2-one-3-yl, pyridin-2-(4-nitrophenylethyl)-one-3-yl, 2-bromopyridine-5-yl, pyridin-2-one-5-yl, 2-aminopyridine-5-yl, and pyridin-2-(4-nitrophenylethyl)-one-5-yl.

16. The composition of claim 1 wherein said A and G modified binding base is a 3-deazauracil or 3-deazacytosine analogue of one of the following structures:



wherein R_1 and R_2, independently, are C_1-C_5 alkyl, C_2-C_5 alkenyl, halo or hydrogen.

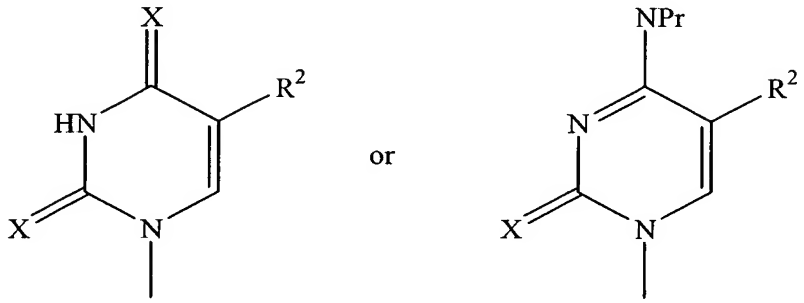
17. The composition of claim 1 wherein said A and G modified binding base is a 5-substituted cytosine or uracil base of one of the following formulas:



wherein

R_2 is selected from the group consisting of propynyl (-C≡C-CH_3), propenyl (-CH=CH-CH_3), 3-buten-1-ynyl (-C≡C-CH=CH_2), 3-methyl-1-butynyl (-C≡C-$CH(CH_3)_2$), 3,3-dimethyl-1-butynyl (-C≡C-$C(CH_3)_3$), phenyl, m-pyridinyl, p-pyridinyl and o-pyridinyl.

18. The composition of claim 1 wherein said A and G modified binding base is a 5-substituted cytosine or uracil base of one of the following formulas:



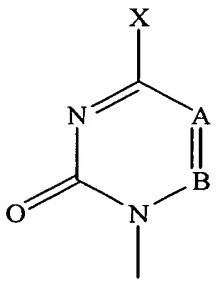
wherein

each X is independently O or S;

R^2 is selected from the group consisting of vinyl, 1-butenyl, 1-pentenyl, 1-hexenyl, 1-heptenyl, 1-octenyl, 1,3-pentadiynyl, 1-propynyl, 1-butynyl, 1-pentynyl, 3-methyl-1-butynyl, 3,3-dimethyl-1-butynyl, 3-buten-1-ynyl, bromovinyl, 1-hexynyl, 1-heptynyl, 1-octynyl, -C≡C-Z wherein Z is C_{1-10} alkyl or C_{1-10} haloalkyl, a 5-heteroaromatic group, or a 5-(1-alkynyl)-heteroaromatic group; wherein the 5-heteroaromatic group and the 5-(1-alkynyl)-heteroaromatic group are optionally substituted on a ring carbon by oxygen or C_{1-4} alkyl or are substituted on a ring nitrogen by C_{1-4} alkyl; and

Pr is $(H)_2$ or a protecting group.

19. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base having the following structure:



wherein

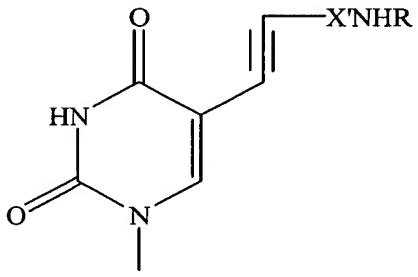
X is OH or NH_2, and

A and B may be the same or different and are C-lower alkyl, N, C-CF_3, C-F, C-Cl, C-Br, C-I, C-halocarbon, C-NO_2, C-OCF_3, C-SH, C-SCH_3, C-OH, C-O-lower alkyl, C-CH_2OH, C-CH_2SH, C-CH_2SCH_3, C-CH_2OCH_3, C-NH_2, C-CH_2 NH_2, C-alkyl-NH_2, C-benzyl, C-aryl, C-substituted aryl, C-substituted benzyl; or one of A and B are as defined above and the other is C-H; or together A and B are part of a carbocyclic or heterocyclic ring fused to the pyrimidine ring through A and B.

20. The composition of claim 1 wherein said A and G modified binding base is 5-alkylcytidine, 5-alkyluridine, 5-halouridine, 6-azapyrimidine, or 6-alkyluridine.

21. The composition of claim 1 wherein said A and G modified binding base is 5-fluorouracil.

22. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of the following structure:

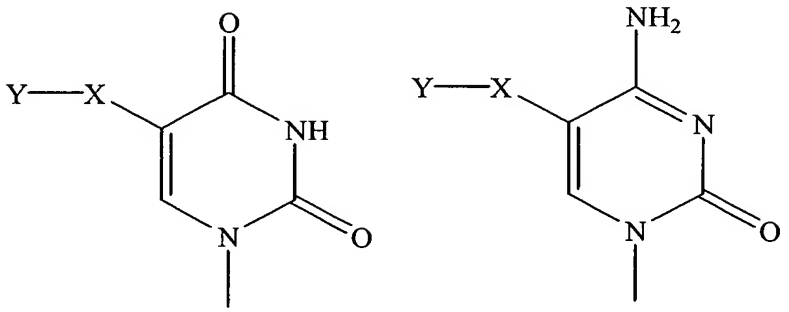


wherein

X' is a branched or unbranched C_{1-15} alkyl group;

R is an amino protecting group, a fluorophore, a non-radioactive detectable marker, or the group Y'NHA, where Y' is a branched or unbranched C_{1-40} alkyl carbonyl group and A is an amino protecting group, a fluorophore, or a non-radioactive detectable marker.

23. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of one of the following structures:



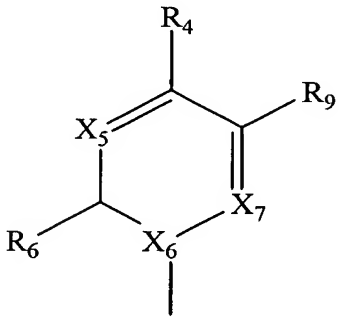
wherein

X is C_1-C_{10} alkyl, C_1-C_{10} unsaturated alkyl, dialkyl ether or dialkylthioether;

Y is $-(NH_3)^+$, $-(NH_2R^1)^+$, $-(NHR^1R^2)^+$, $-(NR^1R^2R^3)^+$, dialkylsulfonium or trialkylphosphonium; and

R^1, R^2, and R^3 are each independently lower alkyl having from one to ten carbon atoms.

24. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



wherein

X_5 is N, O, C, S, or Si;

X_6 is CH or N, and at least one of X_5 and X_6 is N;

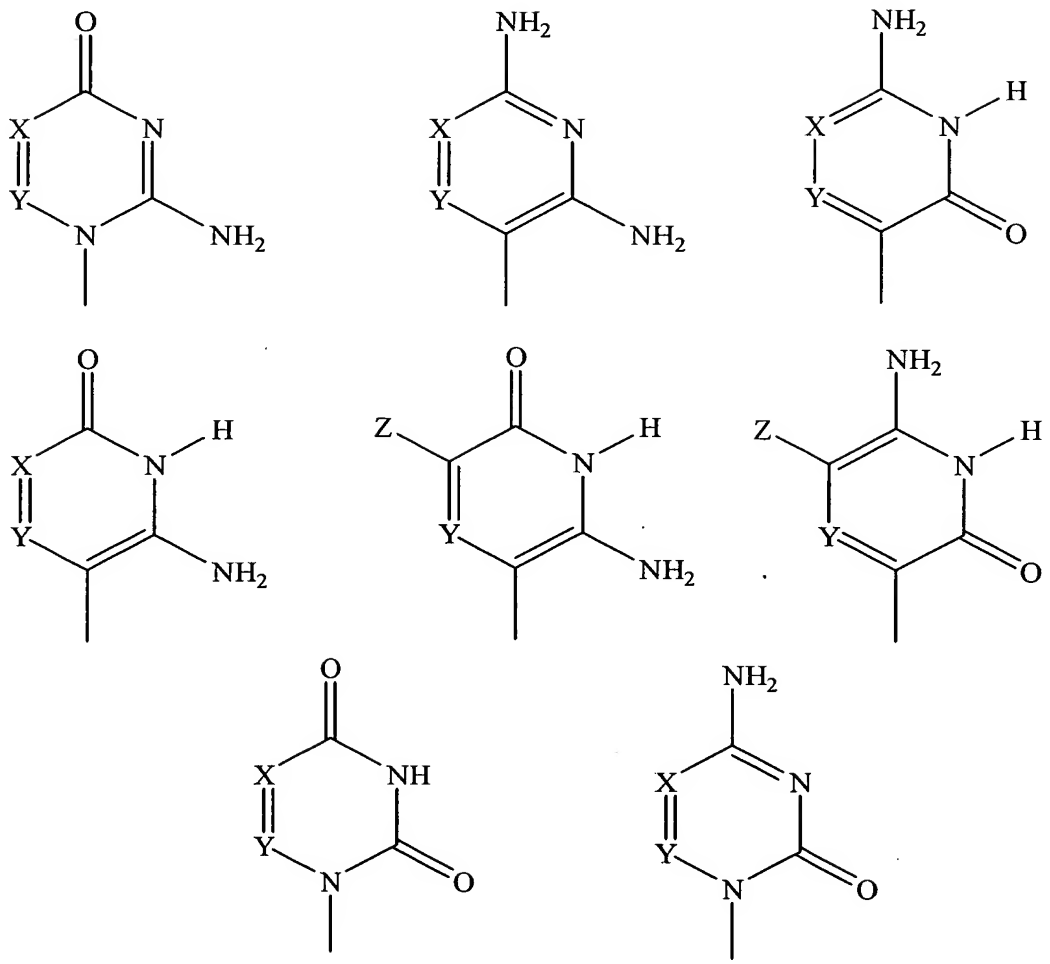
X_7 is -CH-;

R_4 is a reactive group derivatizable with a detectable label wherein said reactive group is selected from the group consisting of NH_2, SH, =O, and a linking moiety selected from the group consisting of an amide, a thioether, a disulfide, a combination of an amide a thioether or a disulfide, R_1-$(CH_2)_x$-R_2 and R_1-R_2-$(CH_2)_x$-R_3 wherein x is an integer from 1 to 25 inclusive, and R_1, R_2, and R_3 are H, OH, alkyl, acyl, amide, thioether, or disulfide, and said detectable label is selected from the group consisting of radioisotopes, fluorescent or chemiluminescent reporter molecules, antibodies, haptens, biotin, photobiotin, digoxigenin, fluorescent aliphatic amino groups, avidin, enzymes, and acridinium;

R_6 is H, NH_2, SH, or =O;

R_9 is hydrogen, methyl, bromine, fluorine, or iodine, alkyl or aromatic substituents, or an optional linking moiety selected from the group consisting of an amide, a thioether, a disulfide linkage, and a combination thereof.

25. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of one the following structures:



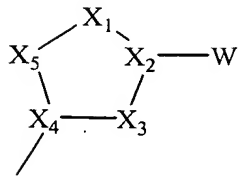
wherein

X is selected from the group consisting of a nitrogen atom and a carbon atom bearing a substituent Z;

Z is either a hydrogen, an unfunctionalized lower alkyl chain, or a lower alkyl chain bearing an amino, carboxyl, hydroxy, thiol, aryl, indole, or imidazoyl group; and

Y is selected from the group consisting of N and CH.

26. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding universal base of the following structure:



wherein

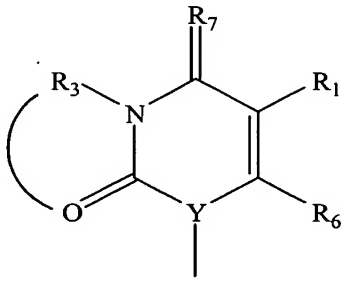
the foregoing structure has at least two double bonds in one of its possible tautomeric forms;

X_1, X_3 and X_5 are each members of the group consisting of N, O, C, S and Se;

X_2 and X_4 are each members of the group consisting of N and C; and

W is a member of the group consisting of F, Cl, Br, I, O, S, OH, SH, NH_2, NO_2, C(O)H, C(O)NHOH, C(S)NHOH, NO, $C(NOCH_3)NH_2$, OCH_3, SCH_3, $SeCH_3$, ONH_2, $NHOCH_3$, N_3, CN, $C(O)NH_2$, $C(NOH)NH_2$, $CSNH_2$ and CO_2H.

27. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



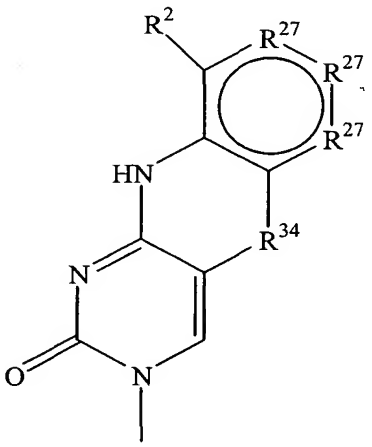
wherein

R_3 is a polycyclic aromatic group;

Y is C or N; R_7 is N or $=C(R_1)$-; and

R_1 and R_6 are independently selected from the group consisting of H, halogen, C_1-C_{10}-alkyl, saturated or unsaturated cycloalkyl, C_1-C_{10}-alkylcarbonyloxy, hydroxy-C_1-C_{10}-alkyl, heterocycle (N,O, or S), and nitro.

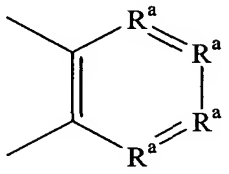
28. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base analogue of the following structure:



wherein

R^2 is $A(Z)_{X1}$, wherein A is a spacer and Z independently is a label bonding group optionally bonded to a detectable label;

R^{27} is independently -CH=, -N=, $-C(C_{1\text{-}8\ alkyl})=$ or -C(halogen)=, but no adjacent R^{27} are both -N=, or two adjacent R^{27} are taken together to form a ring having the structure,

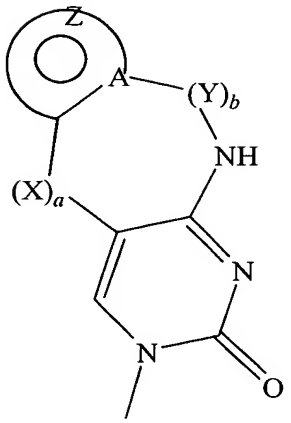


where each R^a is, independently, -CH=, -N=, $-C(C_{1\text{-}8\ alkyl})=$ or -C(halogen)=, but no adjacent R^a are both -N=;

R^{34} is -O-, -S- or $-N(CH_3)-$; and

X1 is 1, 2 or 3.

29. The composition of claim 1 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



wherein

a and b are 0 or 1, and the total of a and b is 0 or 1;

A is N or C;

X is S, O, -C(O)-, NH or NCH_2R_6;

Y is -C(O)-;

Z is taken together with A to form an aryl or heteroaryl ring structure comprising 5 or 6 ring atoms wherein the heteroaryl ring comprises a single O ring heteroatom, a single N ring heteroatom, a single S ring heteroatom, a single O and a single N ring heteroatom separated by a carbon atom, a single S and a single N ring heteroatom separated by a carbon atom, 2 N ring heteroatoms separated by a carbon atom, or 3 N ring heteroatoms at least two of which are separated by a carbon atom, and wherein at least 1 nonbridging ring carbon atom is substituted with R_6 or =O;

R_3 is a protecting group or H;

R_6 is independently H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, NO_2, $N(R_3)_2$, C≡N or halo, or R_6 is taken together with an adjacent R_6 to complete a ring containing 5 or 6 ring atoms.

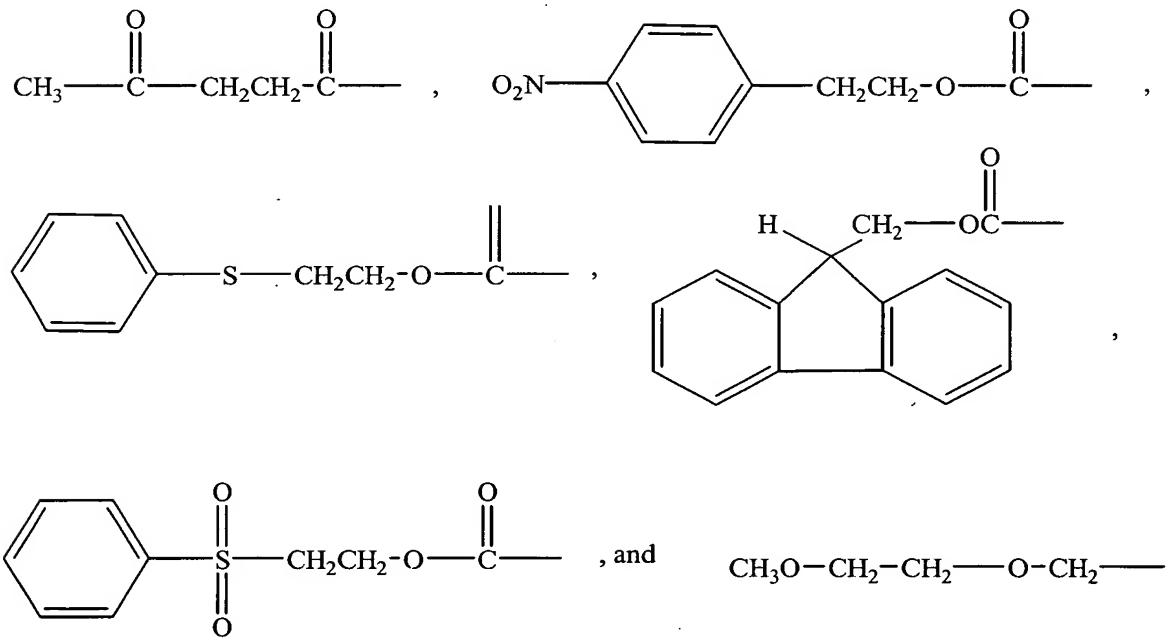
30. The composition of claim 1 wherein said A and G modified binding base is a non-heterocyclic A and G modified binding base of the following structure:

$$-O\text{-}R_m\text{-}O\text{-}R_n$$

wherein

R_m is C_1 to C_{16} alkylene or an oxyethylene oligomer $-(CH_2CH_2O)_z-$ where z is an integer in the range of 1 to 16 inclusive, and

R_n is selected from the group consisting of:



, and .

31. A pharmaceutical composition comprising the composition of claim 1 and a pharmaceutically acceptable carrier.

32. A method of modulating the expression of a target nucleic acid in a cell comprising contacting said cell with a composition of claim 1.

33. A method of treating or preventing a disease or disorder associated with a target nucleic acid comprising administering to an animal having or predisposed to said disease or disorder a therapeutically effective amount of a composition of claim 1.

34. A composition comprising an oligomer complementary to and capable of hybridizing to a selected target nucleic acid and at least one protein, said protein comprising at least a portion of a RNA-induced silencing complex (RISC), wherein:

said oligomer includes at least one nucleotide having an A and G modified binding base.

35. The composition of claim 34 wherein said oligomer is an antisense oligomer.

36. The composition of claim 34 wherein said oligomer has 12 to 50 nucleotides.

37. The composition of claim 34 wherein said oligomer has 15 to 30 nucleotides.

38. The composition of claim 34 wherein said oligomer has 21 to 24 nucleotides.

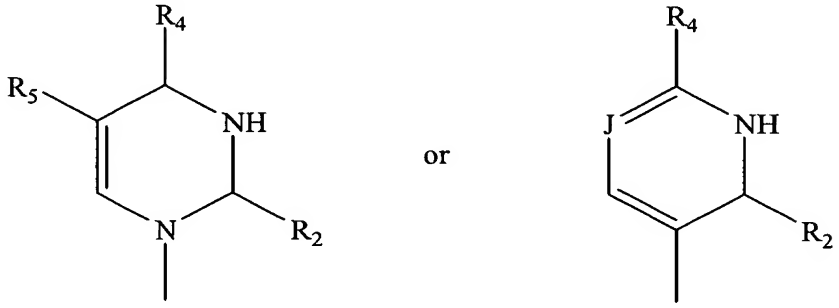
39. The composition of claim 34 including a further oligomer, wherein said further oligomer is complementary to and hydrizable to said oligomer.

40. The composition of claim 39 wherein said further oligomer is a sense oligomer.

41. The composition of claim 39 wherein said further oligomer is an oligomer having a plurality of ribose nucleotide units.

42. The composition of claim 34 wherein said A and G modified binding base is a boronated A and G modified binding base having a boron-containing substituent selected from the group consisting of $-BH_2CN$, $-BH_3$, and $-BH_2COOR$, wherein R is C1 to C18 alkyl.

43. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of one of the following structures:



wherein:

J is N or CH;

R_5 is H or CH_3;

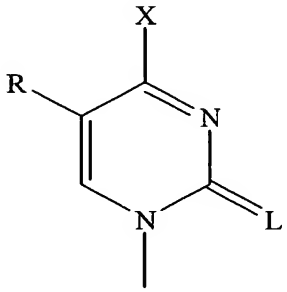
one of R_2 and R_4 is =O, =NH, or $=NH_2^+$ or the tautomeric form -OH, $-NH_2$, $-NH_3^+$; and the other of R_2 and R_4 is Q, $=C(R_A)$-Q, $C(R_A)(R_B)$-$C(R_C)(R_D)$-Q, $C(R_A)=C(R_C)$-Q or C≡C-Q;

R_A, R_B, R_C and R_D, independently, are H, SH, OH, NH_2, or C_1 -$C_{20\ alkyl}$, or one of $(R_A)(R_B)$ or $(R_C)(R_D)$ is =O;

Q is halogen, hydrogen, C_1-C_{20} alkyl, C_1-C_{20} alkylamine, C_1-C_{20} alkyl-N-phthalimide, C_1-C_{20} alkylimidazole, C_1-C_{20} alkylbis-imidazole, imidazole, bis-imidazole, amine, N-phthalimide, C_2-C_{20} alkenyl, C_2-C_{20} alkynyl, hydroxyl, thiol, keto, carboxyl, nitrate, nitro, nitroso, nitrile, trifluoromethyl, trifluoromethoxy, O-alkyl, S-alkyl, NH-alkyl, N-dialkyl, O-aralkyl, S-aralkyl, NH-aralkyl, azido, hydrazino, hydroxylamino, isocyanato, sulfoxide, sulfone, sulfide, disulfide, or silyl; and

when R_2 is =O, R_4 is other than hydroxyl or amine.

44. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



wherein

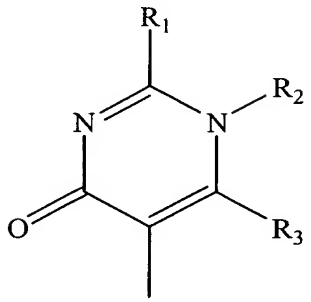
X is hydroxyl or amino;

R is halo or C_1-C_6 alkyl or substituted C_1-C_6 alkyl wherein said substitution is halo, amino, hydroxyl, thiol, ether or thioether;

L is oxygen or sulfur; and

when X is hydroxyl and L is oxygen, R is other than C_1 alkyl

45. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of the following structure:

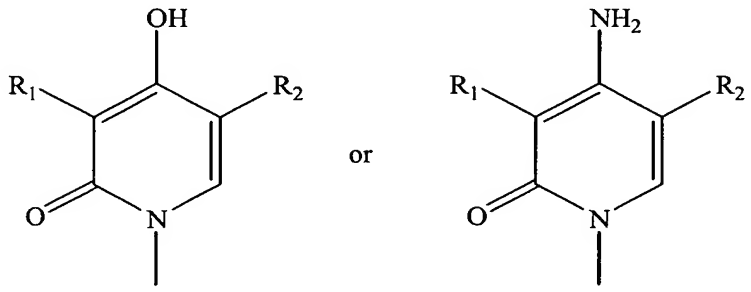


wherein

R_1, R_2, and R_3 can be same or different and are hydrogen, halogen, hydroxy, thio or substituted thio, amino or substituted amino, carboxy, lower alkyl, lower alkenyl, lower alkinyl, aryl, lower alkyloxy, aryloxy, aralkyl, aralkyloxy or a reporter group.

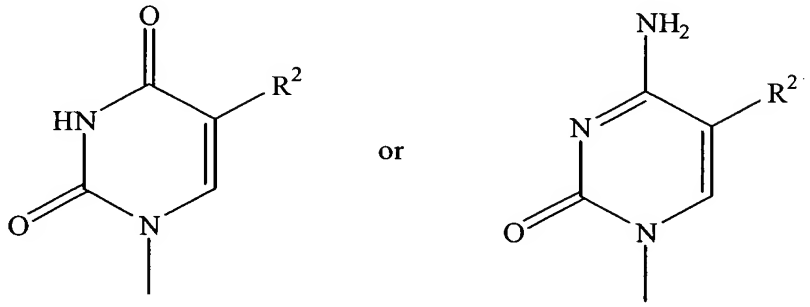
46. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base selected from the group consisting of 2-fluoropyridine-3-yl, pyridin-2-one-3-yl, pyridin-2-(4-nitrophenylethyl)-one-3-yl, 2-bromopyridine-5-yl, pyridin-2-one-5-yl, 2-aminopyridine-5-yl, and pyridin-2-(4-nitrophenylethyl)-one-5-yl.

47. The composition of claim 34 wherein said A and G modified binding base is a 3-deazauracil or 3-deazacytosine analogue of one of the following structures:



wherein R_1 and R_2, independently, are C_1-C_5 alkyl, C_2-C_5 alkenyl, halo or hydrogen.

48. The composition of claim 34 wherein said A and G modified binding base is a 5-substituted cytosine or uracil base of one of the following formulas:

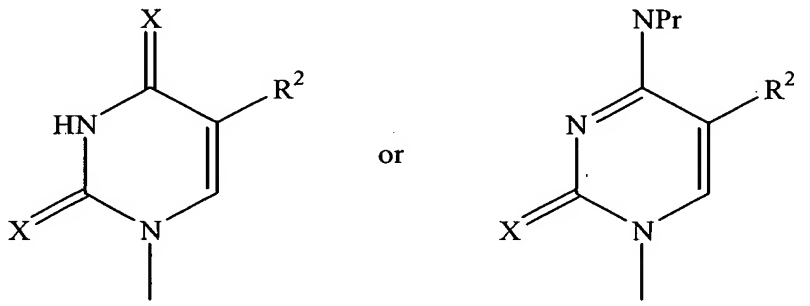


or

wherein

R_2 is selected from the group consisting of propynyl (-C≡C-CH_3), propenyl (-CH=CH-CH_3), 3-buten-1-ynyl (-C≡C-CH=CH_2), 3-methyl-1-butynyl (-C≡C-$CH(CH_3)_2$), 3,3-dimethyl-1-butynyl (-C≡C-$C(CH_3)_3$), phenyl, m-pyridinyl, p-pyridinyl and o-pyridinyl.

49. The composition of claim 34 wherein said A and G modified binding base is a 5-substituted cytosine or uracil base of one of the following formulas:



or

wherein

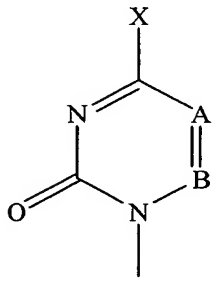
each X is independently O or S;

R^2 is selected from the group consisting of vinyl, 1-butenyl, 1-pentenyl, 1-hexenyl, 1-heptenyl, 1-octenyl, 1,3-pentadiynyl, 1-propynyl, 1-butynyl, 1-pentynyl, 3-methyl-1-butynyl,

3,3-dimethyl-1-butynyl, 3-buten-1-ynyl, bromovinyl, 1-hexynyl, 1-heptynyl, 1-octynyl, -C≡C-Z wherein Z is C_{1-10} alkyl or C_{1-10} haloalkyl, a 5-heteroaromatic group, or a 5-(1-alkynyl)-heteroaromatic group; wherein the 5-heteroaromatic group and the 5-(1-alkynyl)-heteroaromatic group are optionally substituted on a ring carbon by oxygen or C_{1-4} alkyl or are substituted on a ring nitrogen by C_{1-4} alkyl; and

Pr is $(H)_2$ or a protecting group.

50. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base having the following structure:



wherein

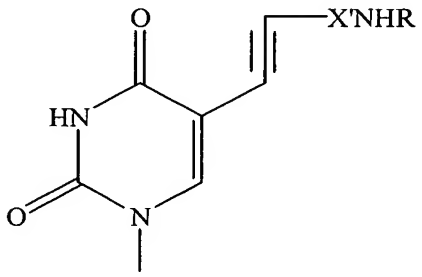
X is OH or NH_2, and

A and B may be the same or different and are C-lower alkyl, N, C-CF_3, C-F, C-Cl, C-Br, C-I, C-halocarbon, C-NO_2, C-OCF_3, C-SH, C-SCH_3, C-OH, C-O-lower alkyl, C-CH_2OH, C-CH_2SH, C-CH_2SCH_3, C-CH_2OCH_3, C-NH_2, C-CH_2 NH_2, C-alkyl-NH_2, C-benzyl, C-aryl, C-substituted aryl, C-substituted benzyl; or one of A and B are as defined above and the other is C-H; or together A and B are part of a carbocyclic or heterocyclic ring fused to the pyrimidine ring through A and B.

51. The composition of claim 34 wherein said A and G modified binding base is 5-alkylcytidine, 5-alkyluridine, 5-halouridine, 6-azapyrimidine, or 6-alkyluridine.

52. The composition of claim 34 wherein said A and G modified binding base is 5-fluorouracil.

53. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of the following structure:

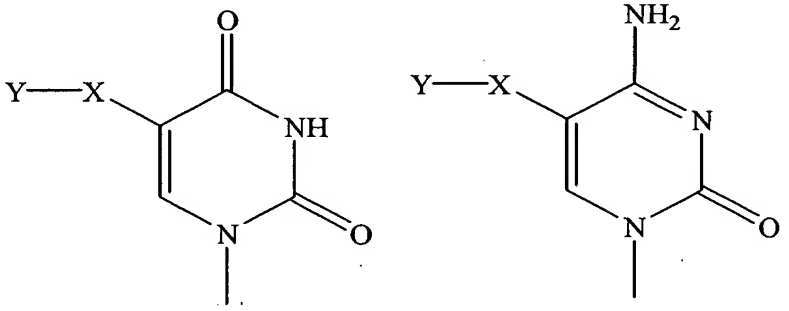


wherein

X' is a branched or unbranched C_{1-15} alkyl group;

R is an amino protecting group, a fluorophore, a non-radioactive detectable marker, or the group Y'NHA, where Y' is a branched or unbranched C_{1-40} alkyl carbonyl group and A is an amino protecting group, a fluorophore, or a non-radioactive detectable marker.

54. The composition of claim 34 wherein said A and G modified binding base is a pyrimidine base of one of the following structures:



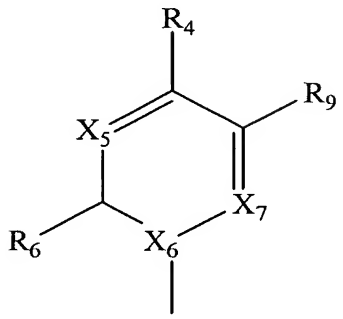
wherein

X is C_1-C_{10} alkyl, C_1-C_{10} unsaturated alkyl, dialkyl ether or dialkylthioether;

Y is $-(NH_3)^+$, $-(NH_2R^1)^+$, $-(NHR^1R^2)^+$, $-(NR^1R^2R^3)^+$, dialkylsulfonium or trialkylphosphonium; and

R^1, R^2, and R^3 are each independently lower alkyl having from one to ten carbon atoms.

55. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



wherein

X_5 is N, O, C, S, or Si;

X_6 is CH or N, and at least one of X_5 and X_6 is N;

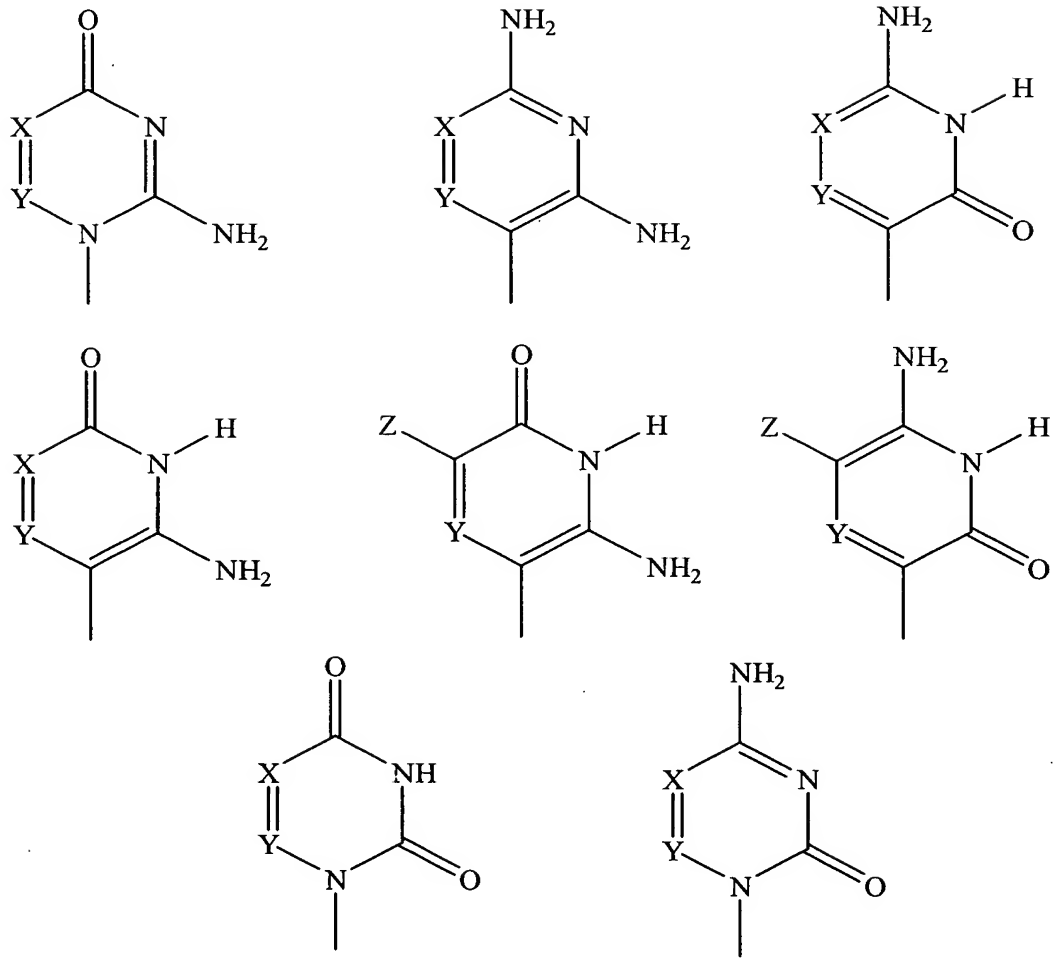
X_7 is -CH-;

R_4 is a reactive group derivatizable with a detectable label wherein said reactive group is selected from the group consisting of NH_2, SH, =O, and a linking moiety selected from the group consisting of an amide, a thioether, a disulfide, a combination of an amide a thioether or a disulfide, R_1-$(CH_2)_x$-R_2 and R_1-R_2-$(CH_2)_x$-R_3 wherein x is an integer from 1 to 25 inclusive, and R_1, R_2, and R_3 are H, OH, alkyl, acyl, amide, thioether, or disulfide, and said detectable label is selected from the group consisting of radioisotopes, fluorescent or chemiluminescent reporter molecules, antibodies, haptens, biotin, photobiotin, digoxigenin, fluorescent aliphatic amino groups, avidin, enzymes, and acridinium;

R_6 is H, NH_2, SH, or =O;

R_9 is hydrogen, methyl, bromine, fluorine, or iodine, alkyl or aromatic substituents, or an optional linking moiety selected from the group consisting of an amide, a thioether, a disulfide linkage, and a combination thereof.

56. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of one the following structures:



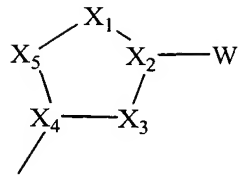
wherein

X is selected from the group consisting of a nitrogen atom and a carbon atom bearing a substituent Z;

Z is either a hydrogen, an unfunctionalized lower alkyl chain, or a lower alkyl chain bearing an amino, carboxyl, hydroxy, thiol, aryl, indole, or imidazoyl group; and

Y is selected from the group consisting of N and CH.

57. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding universal base of the following structure:



wherein

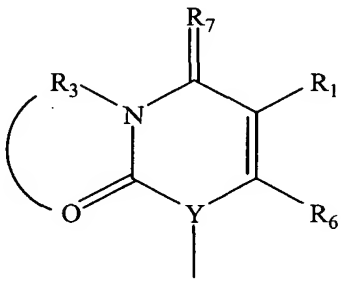
the foregoing structure has at least two double bonds in one of its possible tautomeric forms;

X_1, X_3 and X_5 are each members of the group consisting of N, O, C, S and Se;

X_2 and X_4 are each members of the group consisting of N and C; and

W is a member of the group consisting of F, Cl, Br, I, O, S, OH, SH, NH_2, NO_2, C(O)H, C(O)NHOH, C(S)NHOH, NO, $C(NOCH_3)NH_2$, OCH_3, SCH_3, $SeCH_3$, ONH_2, $NHOCH_3$, N_3, CN, $C(O)NH_2$, $C(NOH)NH_2$, $CSNH_2$ and CO_2H.

58. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



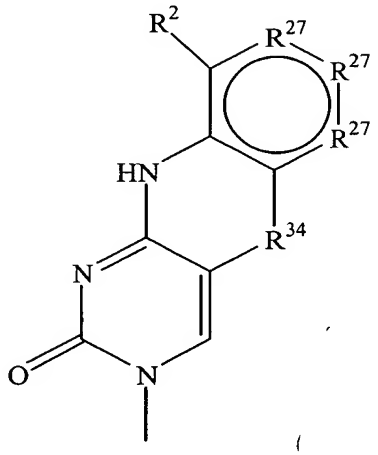
wherein

R_3 is a polycyclic aromatic group;

Y is C or N; R_7 is N or $=C(R_1)$-; and

R_1 and R_6 are independently selected from the group consisting of H, halogen, C_1-C_{10}-alkyl, saturated or unsaturated cycloalkyl, C_1-C_{10}-alkylcarbonyloxy, hydroxy-C_1-C_{10}-alkyl, heterocycle (N,O, or S), and nitro.

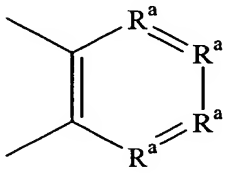
59. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



wherein

R^2 is $A(Z)_{X1}$, wherein A is a spacer and Z independently is a label bonding group optionally bonded to a detectable label;

R^{27} is independently -CH=, -N=, $-C(C_{1\text{-}8\ alkyl})=$ or -C(halogen)=, but no adjacent R^{27} are both -N=, or two adjacent R^{27} are taken together to form a ring having the structure,

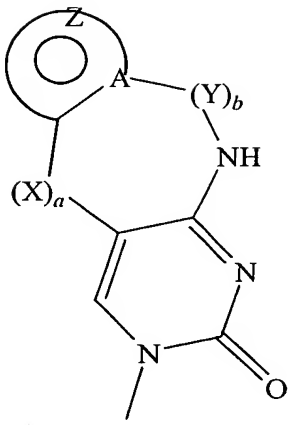


where each R^a is, independently, -CH=, -N=, $-C(C_{1\text{-}8\ alkyl})=$ or -C(halogen)=, but no adjacent R^a are both -N=;

R^{34} is -O-, -S- or $-N(CH_3)-$; and

X1 is 1, 2 or 3.

60. The composition of claim 34 wherein said A and G modified binding base is an A and G modified binding base of the following structure:



wherein

a and b are 0 or 1, and the total of a and b is 0 or 1;

A is N or C;

X is S, O, -C(O)-, NH or NCH_2R_6;

Y is -C(O)-;

Z is taken together with A to form an aryl or heteroaryl ring structure comprising 5 or 6 ring atoms wherein the heteroaryl ring comprises a single O ring heteroatom, a single N ring heteroatom, a single S ring heteroatom, a single O and a single N ring heteroatom separated by a carbon atom, a single S and a single N ring heteroatom separated by a carbon atom, 2 N ring heteroatoms separated by a carbon atom, or 3 N ring heteroatoms at least two of which are separated by a carbon atom, and wherein at least 1 nonbridging ring carbon atom is substituted with R_6 or =O;

R_3 is a protecting group or H;

R_6 is independently H, C_1-C_6 alkyl, C_2-C_6 alkenyl, C_2-C_6 alkynyl, NO_2, $N(R_3)_2$, C≡N or halo, or R_6 is taken together with an adjacent R_6 to complete a ring containing 5 or 6 ring atoms.

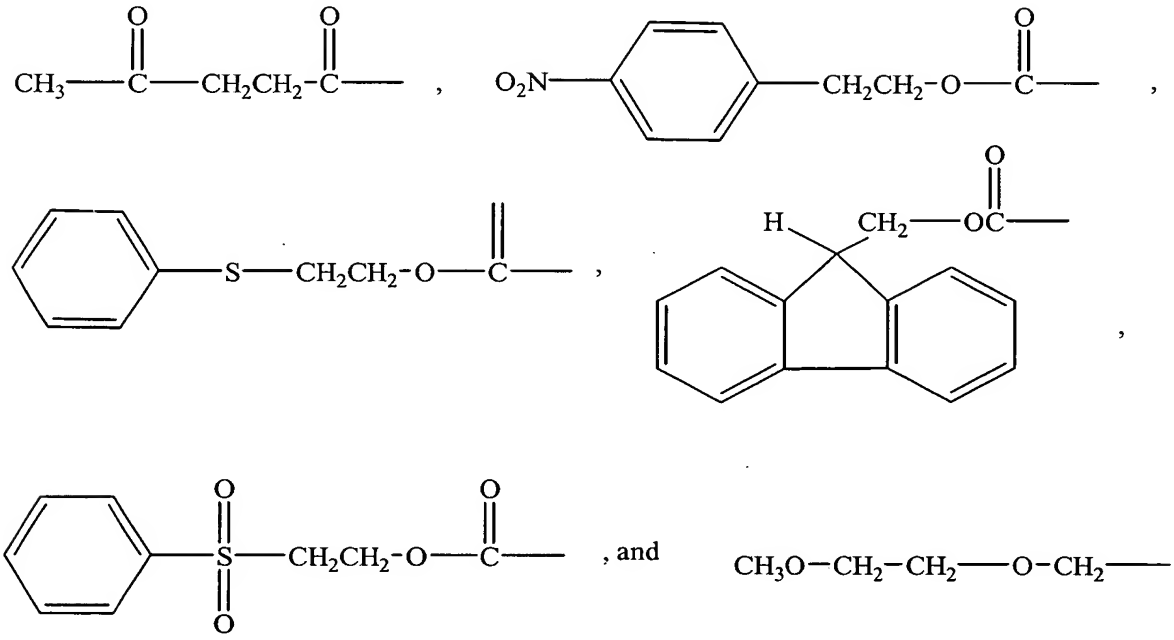
61. The composition of claim 34 wherein said A and G modified binding base is a non-heterocyclic A and G modified binding base of the following structure:

$$-O\text{-}R_m\text{-}O\text{-}R_n$$

wherein

R_m is C_1 to C_{16} alkylene or an oxyethylene oligomer $-(CH_2CH_2O)_z-$ where z is an integer in the range of 1 to 16 inclusive, and

R_n is selected from the group consisting of:



62. A pharmaceutical composition comprising the composition of claim 34 and a pharmaceutically acceptable carrier.

63. A method of modulating the expression of a target nucleic acid in a cell comprising contacting said cell with a composition of claim 34.

64. A method of treating or preventing a disease or disorder associated with a target nucleic acid comprising administering to an animal having or predisposed to said disease or disorder a therapeutically effective amount of a composition of claim 34.